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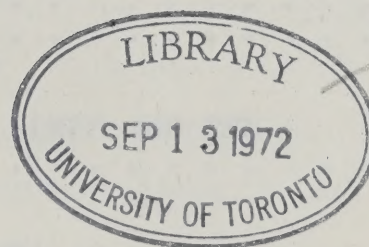
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METRO CENTRE

A Review of the
Transportation Elements



Prepared by the staffs of:

Toronto Transit Commission
Department of Highways, Ontario
Metropolitan Toronto Planning Board

April 1971

[Toronto]

[General Publications]

[G-2]

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SUMMARY OF CONCLUSIONS


This report addresses itself to three specific problems:

- 1) The proposed extension of the Yonge-University subway loop south of Front Street;
- 2) The connection of an intermediate capacity transit system to the main subway system within, or adjacent to, the Metro Centre site, specifically to serve the waterfront area;
- 3) Special consideration of the proposed physical separation between the GO and mainline trains and the subway platform.

The costs, construction difficulties, operational aspects and quality of service associated with the various proposed alternative solutions to these problems have been the subject of review in this study.

Subway

The three subway alternatives - the southerly extension of the subway loop to Queen's Quay or to Esplanade or the expansion of the existing Union Subway Station have been evaluated in some detail. Each has advantages and disadvantages but the basic criteria on which a decision should be made are the quality of service provided to all elements of the travelling public and the operating criteria imposed by the system. It is considered essential that the existing loop which serves the major employment concentration in the downtown area should not be disrupted either by increasing the southerly distance of travel on the loop or by the delays in subway operation which would result from lengthening the loop. While these two criteria are of



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There are three ways of reducing these walking distances between the rail lines (both GO and mainline) and the

- o move the subway closer to the rail lines.
- o move the rail lines (and the Terminal) closer to the subway.
- o reduce the walking times by installing some type of "people-mover" between the rail lines and the subway.

Since this report has strongly recommended that the subway not be moved, and since the developer has stated that it is impractical to change the alignment of the railway corridor in order to bring it closer to the expanded Union Subway Station, it would appear that any improvement of the walking distances and time for passengers changing transportation modes at this location can only be achieved by installation of some type of "people-mover" between the rail lines and the subway. Accordingly, it is recommended that the developer incorporate such facilities in the design and construction of this project.

acquired as a condition of approval, particularly the necessary easement for the expansion of the Union Subway Station.



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I INTRODUCTION

This report has been prepared jointly by the staffs of the Toronto Transit Commission, the Department of Highways, Ontario, and the Metropolitan Toronto Planning Board at the request of the Inter-Governmental Liaison Committee* associated with the processing of the development application submitted by Metro Centre Developments Limited. The request for a review was made in order to clarify issues arising from previous reports and is primarily directed to a re-evaluation of the public transit alternatives related to the Metro Centre Transportation Terminal and the various waterfront developments. The major events leading up to the request for a review are as follows:

- 1) Metro Council, on December 15, 1970, on the recommendation of the Metropolitan Toronto Planning Board, "accepted the principle of an expanded Union Subway Station and an intermediate transit system, subject to further discussions with the Government of Ontario and Metro Centre Developments Limited respecting the division of financial responsibilities for implementing the project" and added the clause

* This committee was established jointly by the Province of Ontario, Metropolitan Toronto and the City of Toronto at the request of Metro Centre Developments Limited. The present representatives are Dr. Keith Reynolds of the Prime Minister's office, Metropolitan Chairman Albert M. Campbell, City of Toronto Alderman David Rotenberg, and the President of Metro Centre Developments Limited, Stewart M. Andrews.

"and subject to an adequate decrease in the distance between the various modes of transportation or to improved facilities for the movement of passengers between the various modes of transportation."

- 2) The City of Toronto Council adopted on February 19, 1971, the following recommendations of the Committee on Buildings and Development regarding "Metro Centre - Transportation Elements" as contained in Report No. 3 of that Committee.
 - i) That the request by City Council for a review by the Metropolitan Corporation of transportation facilities in the Central Area of the City, particularly in relation to transit facilities as highest priorities, be strongly endorsed.
 - ii) That no commitment to an alignment on Front Street for a potential east-west intermediate transit facility be made at this time, in the light of City Council's request for studies in respect to transit service from Union Station to service developments to the west (Ontario Place, C.N.E., Metro Centre Residential Sections, and projected Harbour City Development).
 - iii) That the Metropolitan Corporation, Toronto Transit Commission, the Province of Ontario, and Metro Centre Developments Limited, be

and requested to review the arrangement of the transportation facilities in the proposed terminal area (interchange) because the arrangement presently is considered unacceptable.

iv) That such review, reconsider the feasibility of extending the subway southerly, to provide a vertical transportation interchange, and transit connection to the waterfront.

v) That the Toronto Transit Commission be requested to provide your Committee with information and reports concerning Alternative No. 3* and the Metro Centre proposal with respect to the projected estimates of passenger use, and estimates of inconvenience or convenience to passengers arising out of the proposed location of the stations and loops, and comments on any operational difficulties that would be created by these proposals which should be considered in making a decision concerning these loops, and further to give full details of the effects that either of these proposals would have with respect to the general operations on the Toronto Transit Commission Subway System.

* Alternative 3 moves the rail corridor south as presently proposed and extends the subway southwards to Queen's Quay and provides new stations at the interchange, Queen's Quay, and at Yonge Street.

- 3) Clarification of costs involved with the public transit aspects of the project has become essential in order to facilitate complete evaluation of the three alternatives.
- 4) The proposed intermediate capacity transit* connection to the subway alternatives is reviewed in the light of new information recently available. This information is the result of studies of new intermediate capacity mass transportation modes by Provincial and municipal officials. One significant aspect of these new modes is their acceptability as elevated systems due to their low noise levels and aesthetic designs.

* Intermediate capacity transit is defined as having a passenger-carrying capacity of between 5,000 and 20,000 persons in a peak hour.

II BACKGROUND REVIEW

This report should be read in conjunction with the various staff reports on the Metro Centre project previously prepared. These are the Metropolitan Toronto Planning Board report of October 1970 entitled "Metro Centre: A Planning Review"; the two City of Toronto Planning Board reports on Metro Centre to the Committee on Buildings and Development dated August 18, 1970 and January 19, 1971; and the City Department of Public Works report "Metro Centre - Interim Report" to the Committee on Public Works dated November 2, 1970.

Each of these reports makes certain recommendations regarding the subway alignment and the intermediate capacity transit system connection. In addition, Metro Centre Developments have stated their own preference regarding the subway alignment. These recommendations are summarized as follows:

Metro Centre Developments Limited:

Prefers the subway extension to Queen's Quay - also favours the alternative shown in Figure 4 (page 16).

Has made no specific recommendation regarding the intermediate capacity transit system.

Metropolitan Toronto Planning Board:

Recommended the expanded Union Subway Station alternative. Also recommended by the Toronto Transit Commission.

Accepted the principle of an intermediate capacity transit system (preferably on a Front Street alignment).

City of Toronto Planning Board:

Presented three alternatives of which the subway extension to Queen's Quay was favoured.

City of Toronto Planning Board: (cont'd)

Recommended that no commitment to an alignment on Front Street for a potential east-west intermediate transit facility be made at this time.

City of Toronto Department of Public Works:

Endorsed the expanded Union Station alternative.

Recommended that if an east-west intermediate transit facility be considered necessary, that it be constructed on the Front Street alignment between the Union Subway Station and Bathurst Street.

A detailed summary of these recommendations is contained in the Appendix.

III GENERAL PRINCIPLES OF RAPID TRANSIT OPERATION AND PLANNING IN THE CENTRAL AREA

This section of the report provides background material on general considerations which are critical in the evaluation of alternative subway proposals in the vicinity of Metro Centre. It contains a description of the present function of the subway system, as well as what future transit demands might be and how these might be accommodated. Also discussed here are specific transit proposals which relate to the Metro Centre development. These proposals are evaluated in terms of the service to the downtown core as well as Metro Centre and also in terms of their impact on the existing and proposed transit system itself.

1. The Role of the Subway

The existing subway system in Metropolitan Toronto (Figure 1) is the backbone of public transportation in this municipality. To the end of 1969, \$312.0 million has been spent on this system and if the commitments to the Yonge Street Extension to Finch Avenue and the Spadina Rapid Transit Line are included, this figure exceeds \$515 million. It has been planned and designed as the prime mover of large volumes of people in their daily trips between home and work. At the present time the subway carries approximately 600,000 persons per day representing about 60% of the total public transit ridership. Any proposal to change this system must be given careful and critical consideration in order to ensure that the essential operation of the system is not jeopardized.

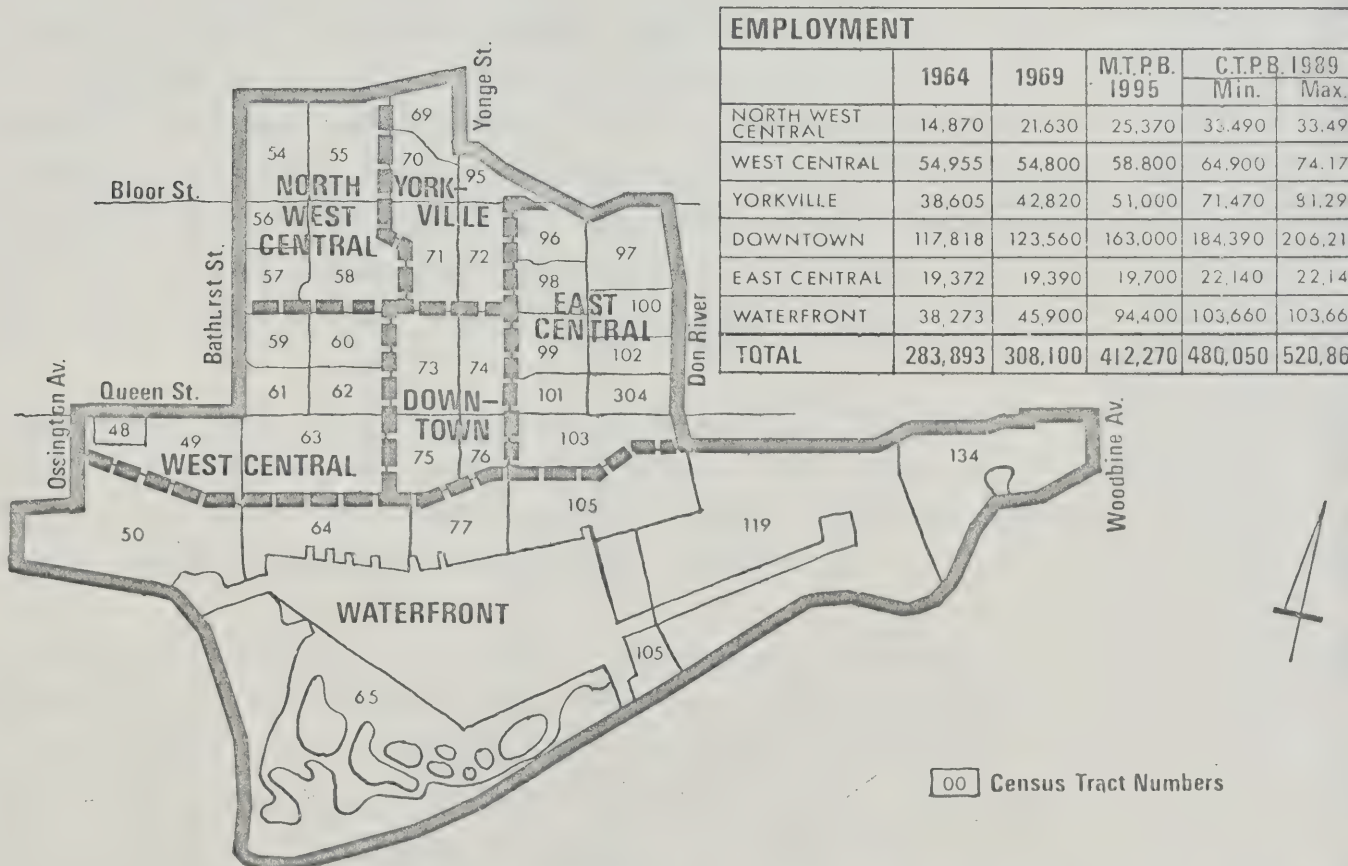


EXISTING TRANSIT SYSTEM Fig. 1

Historically public transportation facilities have carried the major portion of the journey-to-work trips destined into the Toronto downtown core. Recent studies have confirmed that there will be an increasing reliance on public transit, and particularly the subway, to sustain the vitality of the downtown. Hence, there is a basic need to maintain and strengthen public transportation facilities within the whole

Toronto area but in particular it is necessary to provide attractive service to the central core for the peak hour work trips.

Studies of future subway demand are based upon many factors not the least of which is the employment growth expected in the Toronto central area - specifically Planning District 1 (see Figure 2). In recent studies for the year 1995 the peak



EMPLOYMENT GROWTH IN PLANNING DISTRICT 1 Fig.

hour transit demand was predicated on an employment estimate of 412,300 jobs for Planning District 1 - an increase of 128,400 above the 1964 employment level. These employment projections will have a critical effect on the volumes using the transit system in the peak hour of travel. Any high concentration of employment will place severe peak hour passenger loadings on the adjacent transportation links.

2. Accommodating Future Transit Demands

The Yonge Street Subway Extension to Finch Avenue will be in operation by 1974 and the Spadina Rapid Transit Line could be in operation by 1977. These extensions to the existing system are minimum requirements to keep pace with the anticipated demand for subway riding resulting from increased employment in the central area. However, in the event that this anticipated growth has been under-estimated, some overloaded links of the subway lines could occur.

Recently the City of Toronto Planning Board staff have developed estimates of future employment for Planning District 1 (Figure 2) which are significantly higher than the Metropolitan Toronto Planning Board staff estimates.

If these estimates are correct, it seems evident that additional relief to the transit system would be required at some future time to accommodate the additional peak hour demands generated by this increased employment. The Queen Street Subway as presently envisaged, or some other form of rapid transit in this corridor, would be capable of providing the required relief.

A major part of the future commercial development in the waterfront area is expected to occur north of the Gardiner Expressway between Church and Simcoe Streets (i.e. on the Metro Centre lands). It is evident that the Yonge-University Subway line would carry a major share of the transit trips associated with this new development. In the event that the subway were to be extended to Queen's Quay, high density commercial development, additional to that planned at the present, would likely result south of the Gardiner Expressway. While it is expected that the resulting transit passengers would also be carried on the Yonge-University line, it appears possible that the Yonge-University loop will not have the available capacity to accommodate these extra transit passengers. Thus, it would seem to be unwise to deliberately encourage additional high density development south of the Gardiner Expressway.

At the present time the Yonge-University Subway operates around the loop formed by Yonge Street, Front Street and University Avenue. This operation has a very desirable and significant effect on the passenger loadings on both the Yonge and University lines, particularly in the vicinity of Bloor Street. In addition, it appears to afford a convenient service to a considerable number of patrons who chose to ride around the loop (or "horn") or utilize the Union Station. Thus, it is imperative that no decision be made at this time which would preclude either the through or turn-back operation, and that any improvements proposed in the area be flexible enough to allow both operations.

It must be stressed that the decisions regarding the subway location are not affected by the design and location of any

intermediate capacity transit system. The newer modes are sufficiently flexible and adaptable that they can be easily integrated with any of the proposed subway alternatives. Descriptions of the characteristics of four of these new modes is contained in Chapter VI of this report.

3. The Role of a Transportation Terminal at Metro Centre

The concept of a Transportation Terminal within Metro Centre has been considered a central feature of the development plan. The scheme proposes the replacement of Union Station and its re-construction as a Transportation Terminal which would integrate and facilitate the movement of travellers between the various modes of transportation. There is no doubt that this is a desirable goal as long as the relative magnitude of the various passenger transfer movements is kept in perspective and the total system of transportation is not jeopardized in the process. Figure 3 schematically indicates the magnitude of these inter-modal movements and trip interchanges.

A main interchange to be served is that between GO Transit and the subway system. Of minor importance is the movement from the mainline trains and inter-urban buses to the subway. The terminal must be judged in terms of its ability to fulfil these objectives in light of the magnitude and nature of the demand.

Currently the Lakeshore GO Transit system accommodates approximately 20,000 person trips per day. Since it is oriented to downtown Toronto a very high percentage of the

users pass through Union Station. Approximately one-third of the passengers on GO Transit at Union Station transfer to or from the Yonge Street subway or one of the available surface lines. (As a comparison - the Yonge Street subway has a daily volume of about 200,000 person trips crossing a peak point just north of Dundas Street.)

The Planning Board staff has previously estimated a future GO Transit volume of approximately 35,000 to 40,000 person trips per day. The Provincial representatives, on the other hand, felt that it was not inconceivable that there might be 100,000 GO Transit person trips per day with as many as 60% of these passengers transferring to and from the subway.

In reality, the Transportation Terminal as an interchange point cannot be considered simply as the terminal building to house the main line trains but rather should be defined as a number of facilities accommodating the interchange and interconnection of all transportation modes. This actually occurs over a wide area bounded by Front Street, the Gardiner Expressway, Bay Street and University Avenue. The most significant interchanges are related to the Union Subway Station and to the GO Transit lines. It should be noted that these movements do not occur in the Transportation Terminal building itself and it is considered neither desirable nor necessary to create a concentrated central interchange between all possible modes of transportation. In many cases the interchange between certain modes will be of little or no importance.

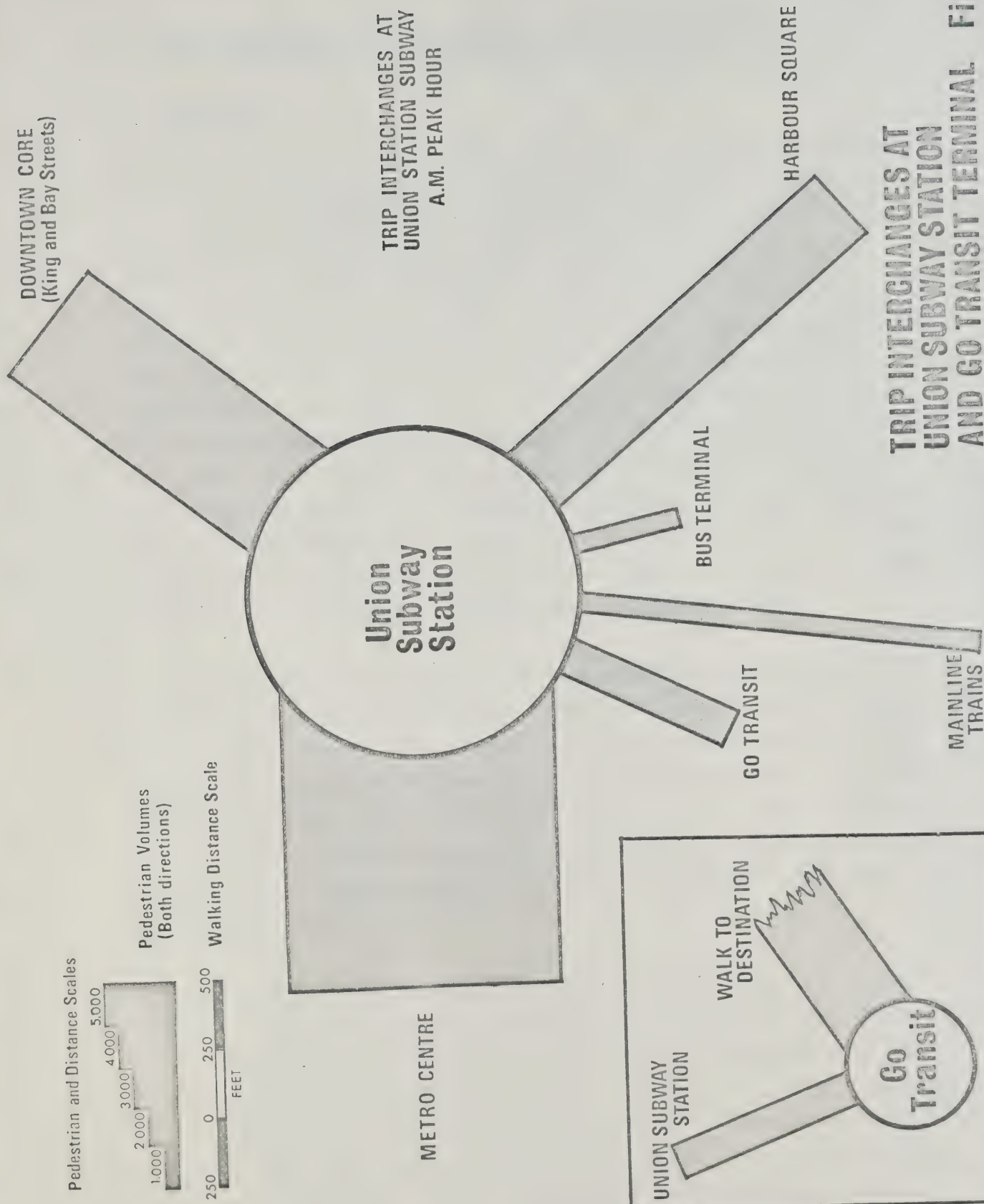


Fig. 3

IV EVALUATION OF SUBWAY ALTERNATIVES

1. General

The three subway alignments: the loop extension to Queen's Quay, the loop extension to Esplanade and the expanded Union Subway Station are evaluated in this chapter. The basis of the evaluation are the general problems and criteria discussed at length in the preceding chapter. The advantages and disadvantages of each alternative are listed and are grouped according to their relation to Transit Operations, Construction and Staging, Quality of Service, the Intermediate Transit Connection, and Cost. It is noted that the costs quoted are "order-of-magnitude" estimates made without benefit of detailed design and were produced only for the purpose of comparison of one proposal against another on a relative cost basis. These estimates do not include cost of land or additional rolling stock.

A fourth alignment, (Figure 4) considered originally, is not evaluated in this report. This alternative involved discontinuation of the subway loop and termination of the Yonge and University lines at a new station under the new railway station (Transportation Terminal). The existing Union Subway Station would be retained as a station on the Yonge line. The alignment has been eliminated for the following reasons:

- Since the Transportation Terminal has been moved east (coinciding with the realignment of University Avenue) it is no longer possible for the proposed terminal subway station to lie within the confines of the Terminal itself. The track (and therefore the station) would be west of University Avenue due to the curvature restraints as the track turns south from Union Station.

- This alternative splits the Yonge-University loop system into two separate lines which is considered to be unacceptable from the standpoint of transit operations.
- Due to the expected distribution of peak hour passenger loads it would still be necessary to rebuild and expand the Union Subway Station.
- Other disadvantages would be the construction problems (similar to those encountered on University Avenue for the subway loop extension) and the high costs anticipated.

This alternative is therefore unacceptable and is not further evaluated.

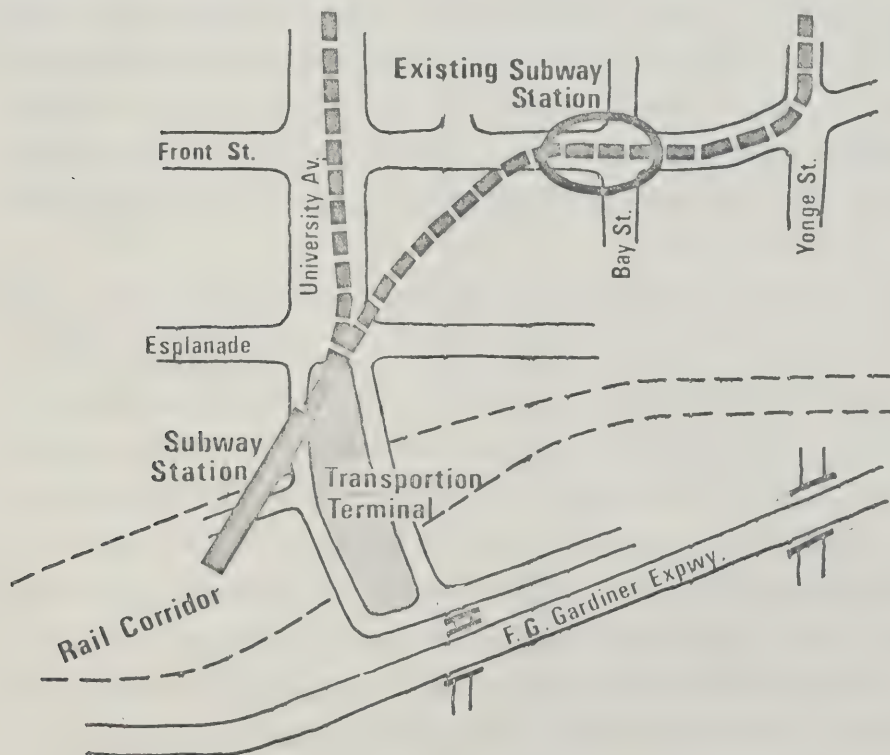


Fig. 4

2. Southerly Extension of the Yonge-University Subway Loop

2.1 General Principles

The original proposal by Metro Centre Developments Limited recommended a southerly extension of the Yonge Street Subway. It appears that this recommendation had been made primarily to provide a subway station under the proposed Transportation Terminal, thus achieving a direct vertical passenger interchange between the subway and the Terminal.

There is no doubt that a southerly extension of the subway, particularly to Queen's Quay, would provide a very high level of transit service to the waterfront area. It would afford subway service to the existing and potential waterfront development as well as for the recreational demands associated with the Harbour and the Island Park. Unfortunately, the demands associated with the recreational activities of the Island are restricted at the present time by the capacity of the ferries and do not, in themselves, justify the construction of a high capacity subway.

The development of office commercial projects in the waterfront area, on the other hand, is a different matter. As discussed earlier (p. 11) it is considered unlikely that the Yonge-University Subway will have the available capacity to accommodate the additional passengers which would be associated with any high intensity commercial development, additional to that planned at present, south of the Gardiner Expressway. Since an extension of the transit line would further intensify the pace of office-commercial development in this area, any extension to the subway must be viewed as extremely unwise in that the quality of service to the downtown core (north of Front Street) would be seriously jeopardized.

The development of high density office-commercial projects in the waterfront area would compound existing transportation problems. Since the residential areas of this municipality are predominantly in the west, north and east, workers must be transported from the suburbs to the city centre. A southerly extension of the commercial core would increase the length of these work trips, and thereby increase congestion and delay to all workers on all modes. There is sufficient indication now that the total transportation system, including roadways, will be strained without encouraging development in this difficult location. Also, in light of the expected characteristics and configuration of the waterfront developments and the existing transportation system, there is a rational argument for the provision of a secondary transit service to any waterfront office development without the extension of the trunk subway system.

Residential development in the waterfront area on the other hand, would complement the existing core area by providing another source of workers for downtown jobs and reducing the travel demand in the traditional rush hour corridors. Many waterfront residents would travel counter to the historical commuting patterns. In any case, this type of development is served better by transit forms other than subways where stations are spread out and walking distances are large.

The draft Part II Official Plan Amendment prepared by the City of Toronto Planning Board recognizes the problems associated with too great an intensification of employment south of the Gardiner Expressway and accordingly proposes commercial development up to 7 times coverage between John Street and Yonge Street north of Queen's Quay (compared to 12 times coverage north of Front Street) and a special

residence/recreation area for the balance of the waterfront area west of Yonge Street.

Any extension of the Yonge-University Subway south of Front Street would add operating miles, and hence cost, to the existing system. The existing patrons who now use Union Subway Station and those destined in the future to Metro Centre would be inconvenienced by the imposition of longer walking distances. Additional passenger loads would be forced to the King Station where problems already exist, and to St. Andrew Station. The area south of Front Street is physically one of the worst in the Metropolitan Area for an extension to the subway due to the combination of serious construction difficulties and associated higher costs. In summary, therefore, changes to the subway system could have a profound effect on the operating characteristics over a wide area and there is little point to the extension of the subway to solve one problem if there is danger of greater problems developing as a result at other points on the total subway system.

The waterfront area is adequately served by transit at the present time by surface routes. This service can be increased as the demand dictates by adding buses, which provide maximum flexibility, on the existing lines and by the provision of new routes. Beyond that, new intermediate capacity transportation systems employing conventional or new mode vehicles can be utilized to provide appropriate service for the increased demands as they become known.

2.2 Construction Problems-Loop Extension

Certain critical problems would be associated with an extension of the subway loop south of Front Street. Since the majority of these problems are common to an extension either to Esplanade or Queen's Quay, they are discussed below prior to the separate evaluation of alternatives.

Since the present alignment of the Yonge and University Subways is converging, it would be necessary to undertake major reconstruction as far north as the St. Andrew and King Stations to obtain even minimum curves for the south loop. This requirement would create the following serious construction problems on University Avenue and on Yonge Street.

University Avenue Connection

- (a) University Avenue, south of Wellington, must be closed for the duration of construction - possibly two years. This would cut off access to buildings in this area, creating an intolerable situation. It would not be possible to deck University Avenue because:
- Decking supports must provide a clear span in excess of 100 feet to permit construction. This would require a truss of at least five feet in depth. Thus, it would be necessary to raise the road at least six feet to provide room for the truss and deck. It is doubtful whether the location of existing utilities would permit the placement of pile supports of the size required.
 - The long duration of construction is expected because the bulk of the work involved in this construction must be done in off-service hours.

- (b) The parking garage structure south of Wellington Street must be demolished in order to remove the subway roof to permit the removal of the internal walls.

Because of the wider span involved, the new structure would require a much thicker roof slab at a higher elevation than the original. Since this added thickness would reduce the headroom in the garage to a point that it is unusable, it would be impossible to restore the parking garage.

- (c) Although most of the construction work is done in off-service hours, it would be necessary to impose "slow orders" on service at times for varying durations, seriously affecting subway operation on the total system. In addition, it seems unlikely that the necessary track changes could be accomplished in periods not exceeding weekends in duration.

Yonge Street Connection

- (a) Yonge Street would have to be decked from Wellington Street south. Decking operation would require a complete closure of Yonge Street, because of the full span requirement of the deck.
- (b) The earth cover which is necessary to support the utilities would have to be removed from the subway.
- (c) Subway roof would have to be removed to permit the demolition of the interior walls.

- (d) Although the bulk of subway demolition and construction must be done in off-service hours, "slow orders" would still be required, seriously affecting subway operation.
- (e) The subway structure would be less than four feet below the road surface at the Yonge Street Railway underpass. Since the subway structure affects the centre pier and west abutment, it would be necessary to rebuild the north end of the underpass to accommodate the subway. This assumes the removal of railroad traffic over the portion being rebuilt, and also a long closure of Yonge Street. The 5' x 8' sewer on Yonge Street south of Front Street would require relocation as would the low level interceptor sewer at Front and Yonge Streets.
- (f) There is an element of doubt that the necessary track changes could be accomplished in periods not exceeding weekends in duration. In any event, "slow orders" would be required on the subway service during this period.

2.3 Subway Extension to Queen's Quay

In this alternative the Yonge-University Subway loop is extended to the south with north-south stations on the University alignment at the Transportation Terminal and on the Yonge alignment in the vicinity of Esplanade. This alternative would also have a third station at the bottom end of the loop in the vicinity of Queen's Quay and Bay Street (Figure 5)

Transit Operations

Advantages

Disadvantages

Because of the significant extension and the additional stations on the line, the "around-the-horn" movement to King, Queen and Dundas would be materially affected.

The third station at the bottom end of loop would require extensive trackage facilities to provide for "through" operation as well as "turnback".

The increased line distance for this alternative is estimated at over 3500 feet with an increased riding time of 2 minutes, 6 seconds. To maintain the existing headways an extra train in each direction would be required.

Construction & Staging

Advantages

Disadvantages

See also pages 20-22. Complications at the Yonge railway underpass would be greater than for the Esplanade scheme. Complete re-construction of the underpass would be required for this alternative.

Quality of Service

Advantages

Disadvantages

Station on Yonge Street could serve O'Keefe Centre.

Harbour Square could be served if third station were included.

Pedestrian connections from the T-D Centre would have to be extended into the Metro Centre development then east and west to the University and Yonge Stations. Poor service for those persons destined to the

Quality of Service (cont'd)

Advantages

Provides fully integrated service to the east-west spine of the entire project. This would be especially well-used with a station at each end.

Provides good connections to the transportation elements in Metro Centre.

Disadvantages

south downtown developments with possible overload problems at the King Station as a result.

Very difficult to construct without disruption to subway service.

While this alternative provides two additional stations to serve Metro Centre, the two subway stations (at the Transportation Terminal and at Yonge Street) do not provide nearly as good service to the main commercial super block as the station at Bay in either the Front Street or the Esplanade alternative.

Intermediate Transit Connection

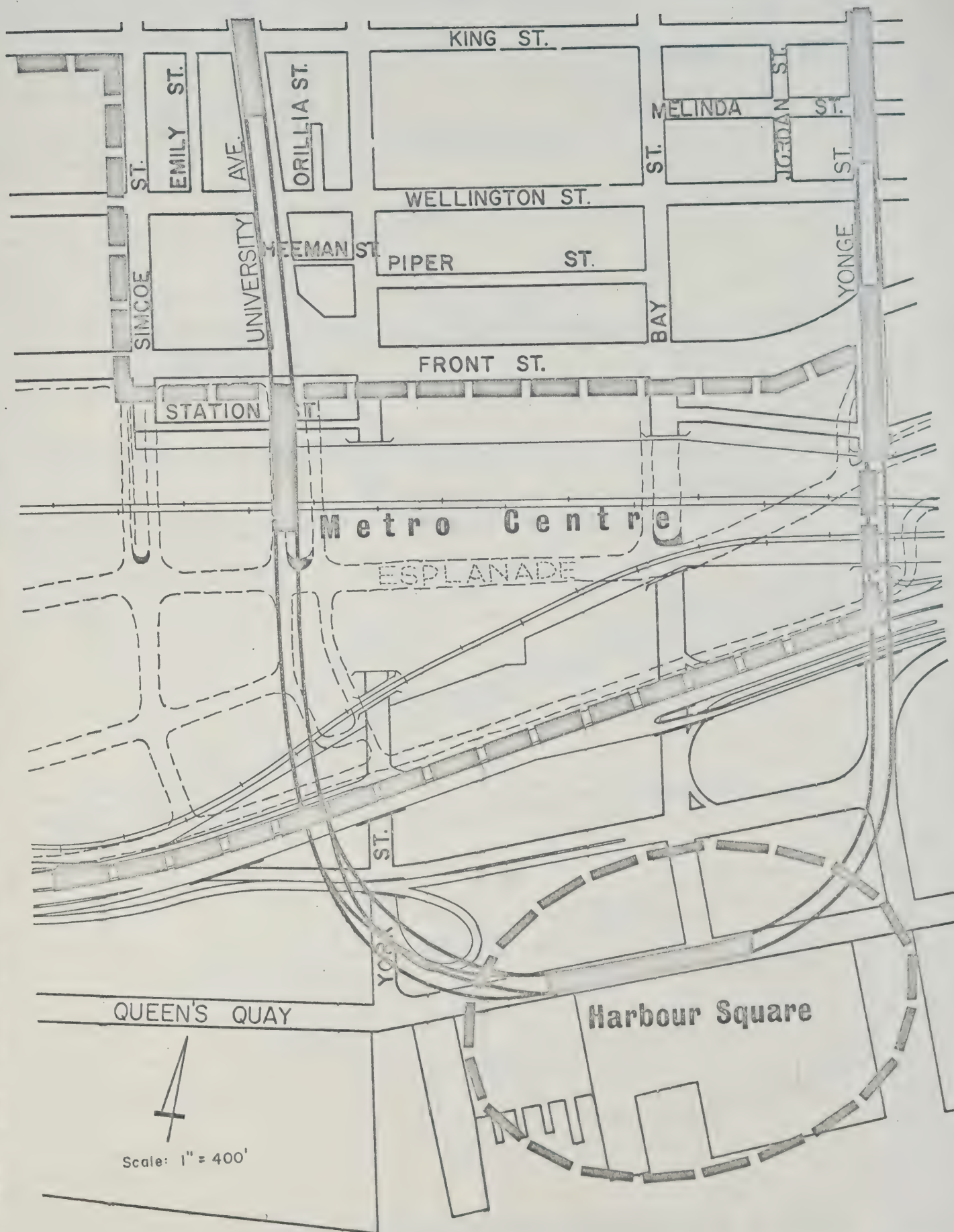
Advantages

An intermediate capacity system can be accommodated without great difficulty.

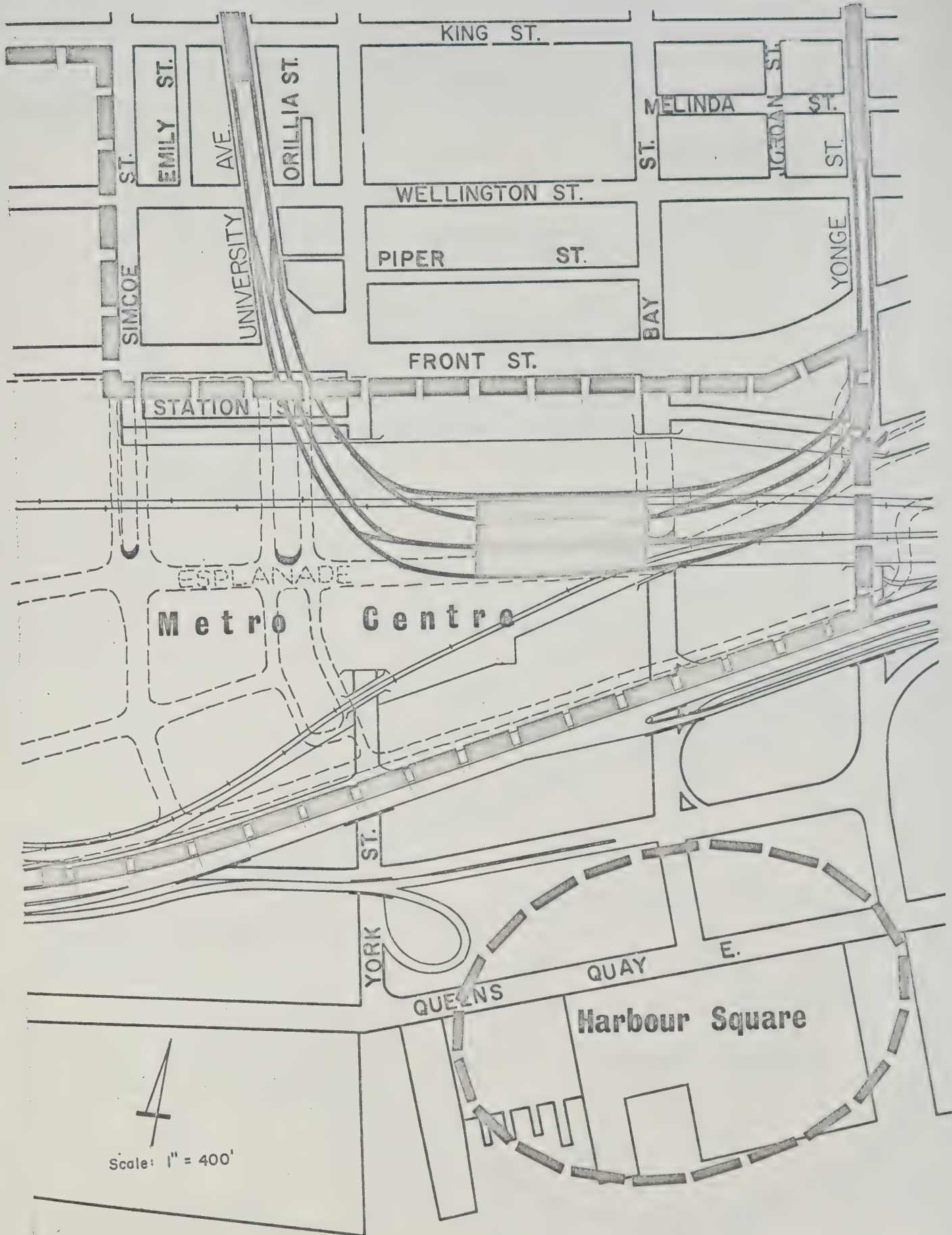
Disadvantages

Cost

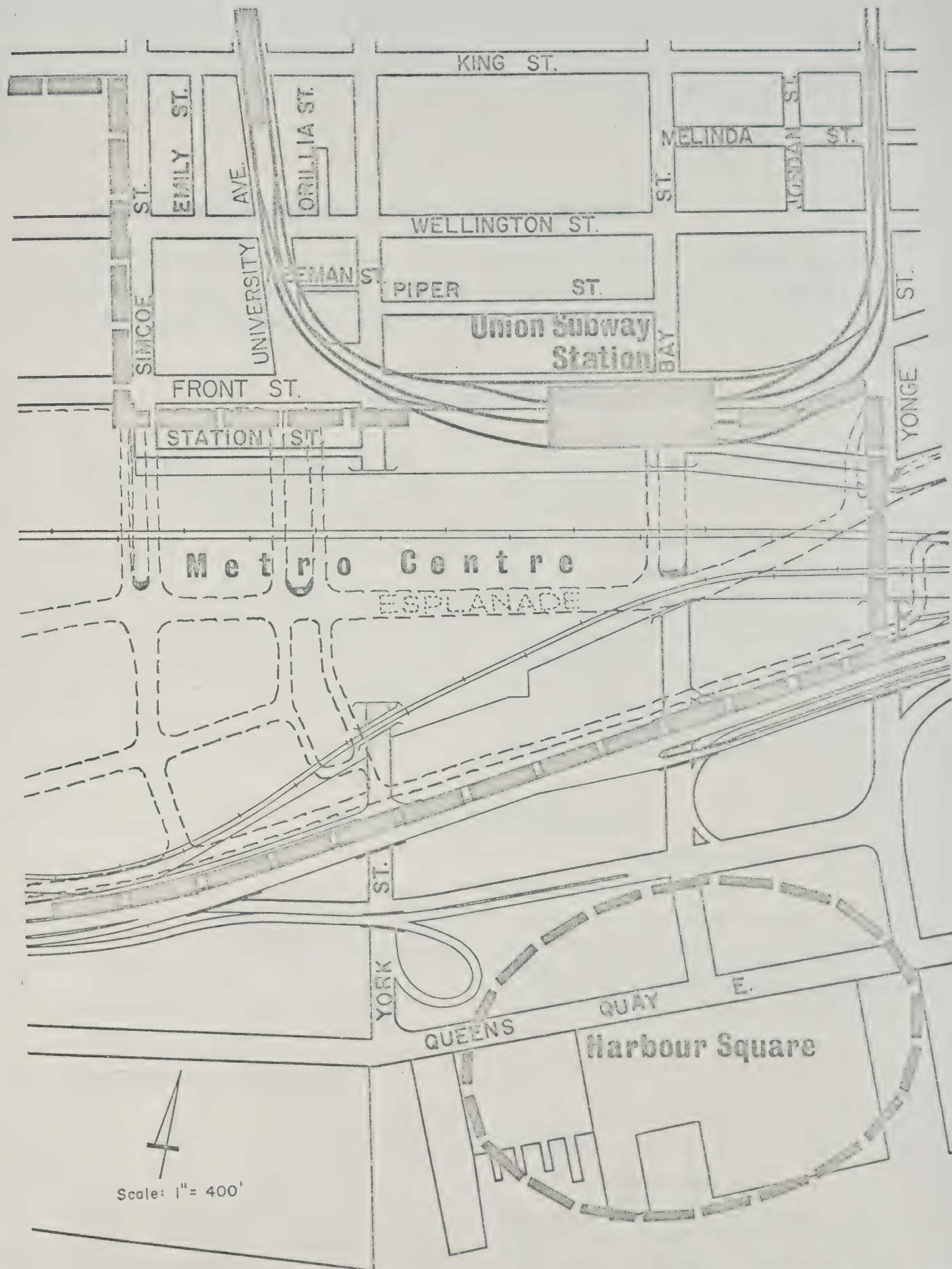
The cost of this alternative is estimated at \$75.0 million. This includes three stations with full turnback facilities provided to the station at the south end. The value of assets to be abandoned is not included - parking garage \$1.2 million and Union Subway Station and trackage \$15.0 million. None of these estimates includes any provision for increased operating costs due to the addition of two stations, increased trackage and the addition of two trains. This alternative must be included in Phase I in its entirety, and would therefore require a very heavy capital investment in the immediate future.



SUBWAY EXTENSION TO QUEENS QUAY Fig. 5



SUBWAY EXTENSION TO ESPLANADE STREET Fig. 6



UNION SUBWAY STATION EXPANSION Fig. 7

2.4 Subway Extension to Esplanade Street

This alternative involves also abandoning the existing Union Station and creating a similar expanded station facility to the south in the vicinity of Esplanade (Figure 6).

Transit Operations

Advantages

New station located in area where operating noise would not be a problem.

Disadvantages

Difficult to construct without serious disruption to subway operation.

See also pages 20-22.

While the "around-the-horn" and turn-back operations could still be provided, the additional travel time in this alternative would be greater than that at the expanded Union Station but not as great as that caused by the extension to Queen's Quay.

Construction and Staging

Advantages

Permits new station to be built on "open" ground as the railroad facilities are abandoned with little disturbance to utilities.

Relatively light building - Convention Hall over the part of the structure south of Esplanade Street.

Disadvantages

See also pages 20-22.

Increased trackage under Federal Building at Front and Yonge (this building is not scheduled to be demolished but is to be added to the development).

Quality of Service

Advantages

Good location to provide connections to other forms of transportation and to the commercial elements in Metro Centre.

Disadvantages

New station further from T-D Centre and CIBC Complex thus tending to further load King and St. Andrew Stations.

Intermediate Transit Connection

Advantages

An intermediate capacity system can be accommodated without great difficulty.

Disadvantages

Cost

The cost of this alternative is estimated at \$40.0 million. As with the other alternatives the value of assets to be abandoned is not included (University Avenue parking garage and Union Subway Station and trackage) and neither are land, rolling stock and terminal facilities for the intermediate rapid transit line. This alternative must be included in Phase I, in its entirety, and would, therefore, require a very heavy capital investment in the immediate future. However, no use of such facilities would be made for some considerable time.

3. Subway on Front Street- Expanded Union Station

This alternative (Figure 7) provides for the expansion of Union Station at its existing location. The expanded facilities would include the additional platforms and trackage which would permit turn-back operation in both directions. Peak hour volumes of 50,000 persons are anticipated to use this station.

Transit Operations

Advantages

It permits the continued "around-the-horn" operation while providing additional turn-back facilities, should their use be required in the future. No additional travel time for through riders.

Disadvantages

Special precautions required to prevent problems from operating noise under the proposed office development.

Transit Operations (cont'd)

Advantages

The additional platform facilities, trackage etc., can be provided relatively easily without disturbing the existing operation except for brief periods during weekends or at night.

Cross platform transfer possible for split operation.

Disadvantages

Construction and Staging

Advantages

It requires very little, if any, expenditure of monies at the present time. The additional station facilities can be added as the project develops.

No conflict with extension of University Avenue through the development.

Disadvantages

Piecemeal expansion of the Union Subway Station would be structurally difficult and could present serious scheduling difficulties because of the necessity to integrate the subway construction with the construction of the office towers.

Relocation of the main Front Street interceptor sewer is required for this alternative.

Quality of Service

Advantages

It brings the majority of passengers destined for the Metro Centre to the closest point of employment concentration in the Centre.

It retains the existing proximity to the Toronto-Dominion Centre and to other developments to the north.

Disadvantages

Additional walking distance for transfer to other forms of transportation within Metro Centre. Possibly requiring use of pedestrian conveyors.

The walking distance from the subway to GO would be 650 feet and to the long distance rail, approximately 1450 feet.

Intermediate Transit Connection

Advantages

An intermediate capacity system can be accommodated without great difficulty.

Disadvantages

Cost

The cost of this alternative is estimated at \$29.0 million. No additional rolling stock would be required. Also this alternative does not require the abandonment of the existing Union Subway Station or the trackage under Front Street. No capital expenditures would be made in the first phase of construction but would be made available only as the need arose.

4. Summary of Alternatives

Each of the three alternatives has specific advantages and disadvantages connected with it. The extension of the subway loop either to Esplanade or to Queen's Quay has extremely serious construction and staging problems. Certainly the closure of University Avenue and Yonge Street south of Wellington must not be dismissed easily. Both University Avenue and Yonge Street are heavily used arterial roads linking the Gardiner Expressway and the downtown core. Closure of either of these roads would be intolerable.

Any extension of the transit loop will have a serious effect on the operation of the transit system as a whole, with the possible effects of unbalancing the critical Yonge-University passenger loadings. It is noted that the quality of transit service to the downtown core is seriously reduced by the removal of the Union Subway Station.

The Queen's Quay extension, in providing excellent service to the waterfront, will encourage intense commercial redevelopment south of the Gardiner Expressway which, in turn, will cause overloading problems on the Yonge-University lines. The cost of \$75 million for this alternative cannot be disregarded.

The more moderate extension of the loop to the Esplanade should also be discounted in that it only provides a decrease in the walking distance between the GO service and the subway at the expense of increasing the walking distance of certain subway passengers from the new Esplanade station north towards the core area. Again, all the problems in construction and delays during the construction period would be experienced as with the larger loop extension.

After detailed examination of the alternatives, it is concluded that the Union Subway Station, to be expanded as the demand arises, provides the best answer in the interests of the total downtown and Metropolitan Area.

V SEPARATION BETWEEN THE RAIL LINES AND THE SUBWAY

The existing distance between the foot of the stairway leading to the GO Transit platforms and the subway mezzanine is about 680 feet. The corresponding distance from the subway mezzanine to the long distance rail gates is 740 feet. These distances are outlined in the accompanying sketch (Figure 8) and are from points A to C (GO to subway) and B to C (long distance rail to subway).

The Metro Centre plan indicates the corresponding GO to subway distance at 650 feet and the long distance rail to subway distance at 1450 feet. These distances are shown in Figure 9 as A to C and B to C respectively. In its report "Metro Centre - Transportation Elements", dated January 19, 1971, the City of Toronto Planning Board staff makes the following statement regarding the above distances:

"Following further detailed development of Metro Centre's plan, this distance (GO to subway) has now increased to 850 feet, while the gate to gate distance between the mainline and subway is now proposed as 1600 feet. The present distances are caused by moving the existing east/west rail commuter lines southward from their present location while the subway remains at Union Station."

While it is true that "the existing east-west rail commuter lines" are moved southward, the real result of this is that the GO to subway walking distance is actually reduced from 680 feet to 650 feet. The reasons for this reduction are the southward expansion of the mezzanine and subway platforms,

and the straightening of the pedestrian walkway inter-connecting the rail and subway lines. The walking distance from the long distance rail station to the subway increases, however, from 740 feet to 1450 feet.

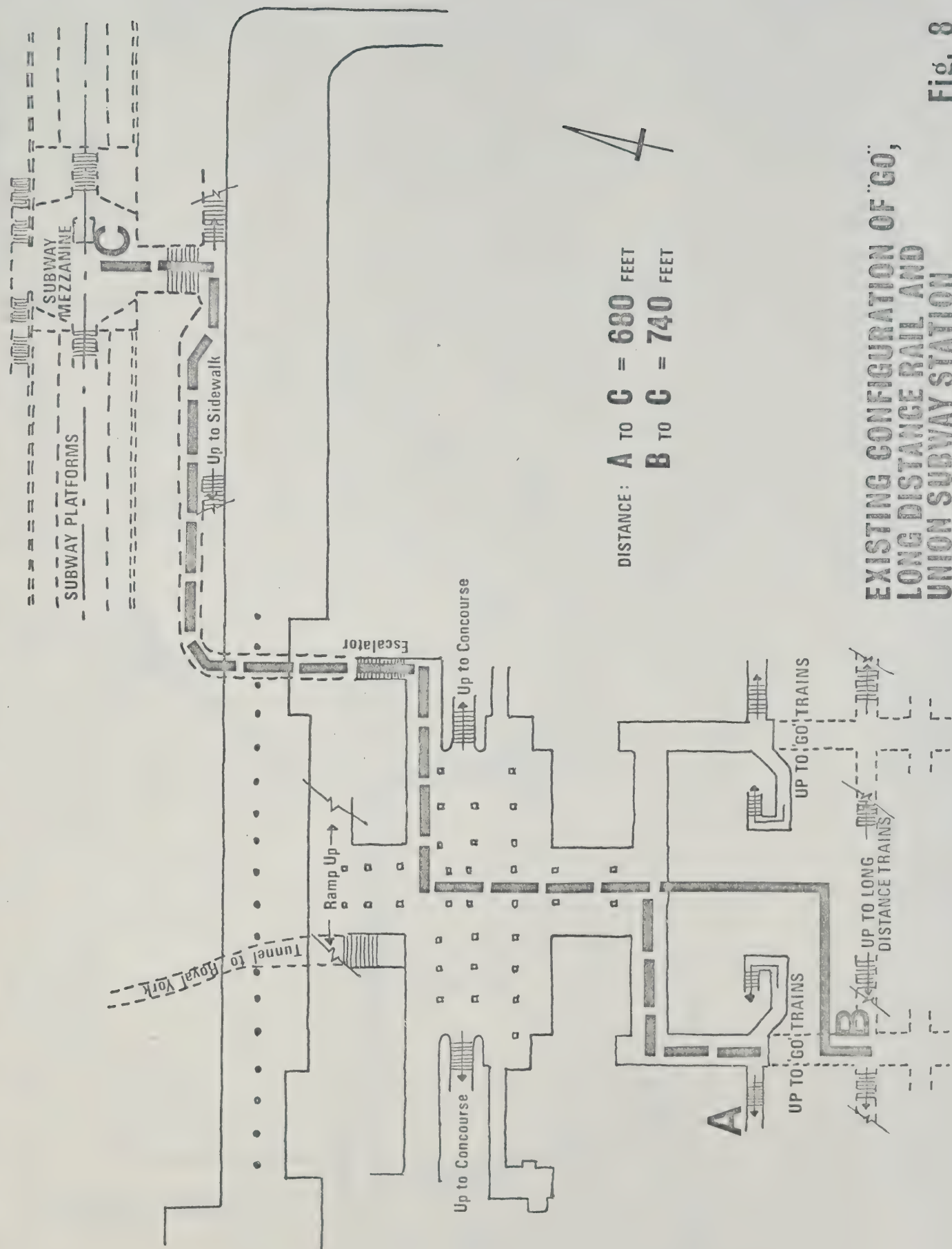
The "further detailed development of Metro Centre's Plan" referred to by the City above is actually a preliminary drawing by the Toronto Transit Commission engineering staff of the proposed expansion of Union Subway Station. The mezzanine entrance is shown centred on the subway platforms at point C' so that the extra 200 foot walking distance in question (650' to 850') is actually the distance from point C to point C' on an east-west axis.

This problem can be remedied by moving the subway mezzanine gate to the west as far as possible (to point C). In addition, the GO to subway distance could be further reduced by providing a more direct north-south pedestrian concourse to serve that interchange. Preliminary investigation indicates that this distance could likely be reduced to about 500 feet (say from A' to C) by careful attention to the alignment of connecting facilities. Some horizontal separation between these transportation modes is desirable in order to achieve the best and most efficient flow of pedestrian volumes and a separation of 500-650 feet between GO and subway is considered acceptable. The mainline train to subway distance, however, is unfortunately long although the interchange volumes between these modes are expected to be extremely low. The vast majority of train travellers end (or begin) their journey in a taxi or a private car. Nevertheless, it is suggested that some form of "people-mover" be utilized to reduce the walking times between the rail lines and the subway.

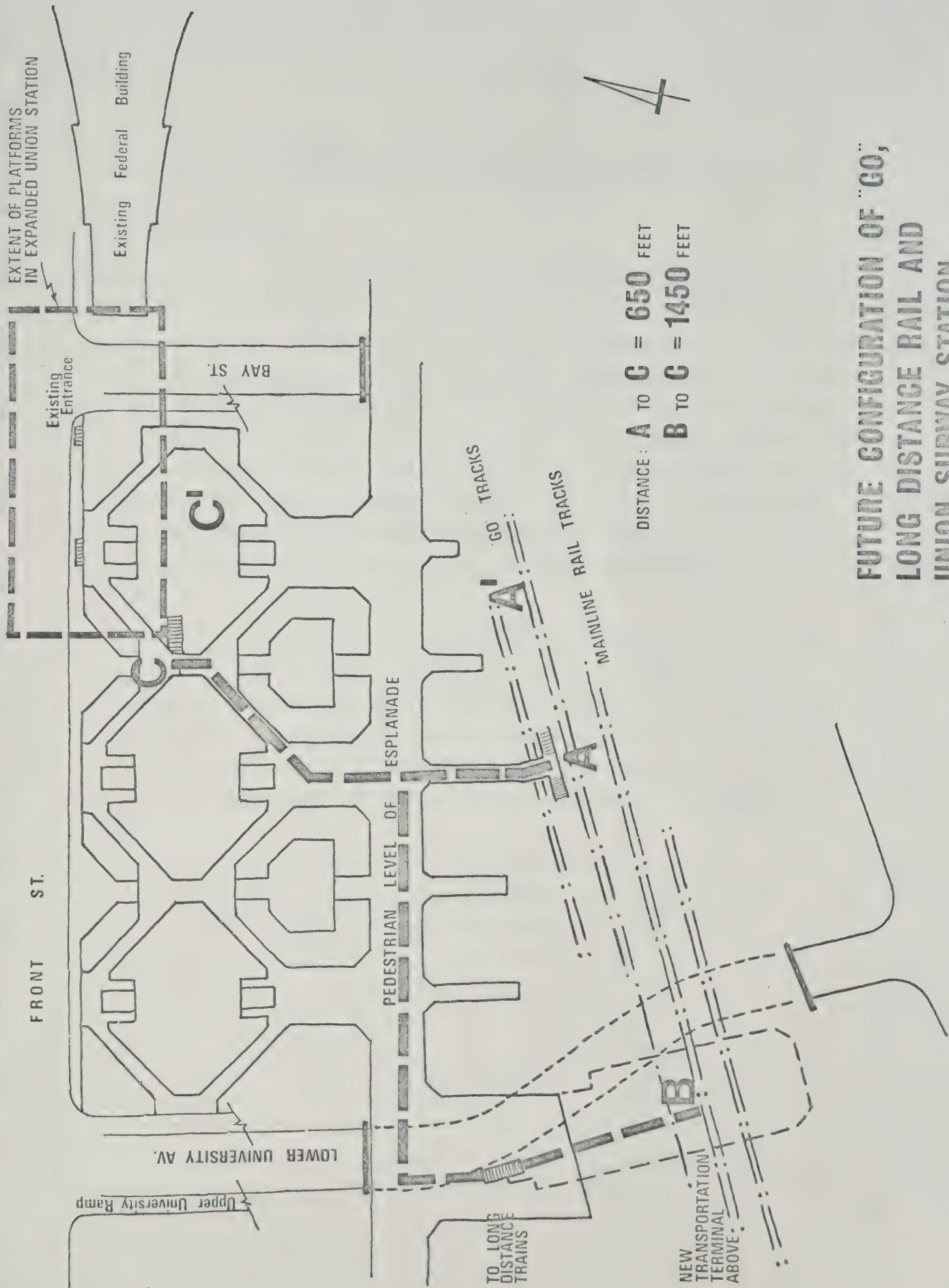
It is noted that the developer is addressing himself to the problem of reducing the GO to subway walking distance and that he has stated that he is "endeavouring to reduce the 650 foot distance by moving the GO platforms further east". In the event that he is unsuccessful, it is suggested that the proposed 650 feet is acceptable as a maximum walking distance.

The City of Toronto Planning Board staff has developed three alternatives which attempt to reduce these walking distances. Their "Alternative 2"* appeared to have considerable merit; it provided a redesign of the project which reduced the GO and mainline to subway walking distances significantly (to 200 and 250 feet respectively) while permitting the subway to remain at Front Street with an expanded Union Subway Station. However, the developer has stated that it is impossible to incorporate this alternative into his plan of development.

"* Alternative 2 moves the rail corridor to the south as presently proposed, and locates the mainline and GO station in a central position relative to an expanded Union Station Subway."



EXISTING CONFIGURATION OF GO,
LONG DISTANCE RAIL AND
UNION SUBWAY STATION



FUTURE CONFIGURATION OF "GO",
LONG DISTANCE RAIL AND
UNION SUBWAY STATION

VI INTERMEDIATE CAPACITY TRANSIT

1. General

In the Metropolitan Toronto Planning Board report of October 1970 an intermediate capacity transit line connected to Union Subway Station was investigated in great detail. At that time elevated systems were rejected at the request of the developer who stated that he would not permit an elevated transit line (with its attendant adverse environmental characteristics and loss in amenities) through his lands. Thus, an underground system was recommended in order to connect with the Union Subway Station and to pass under the existing York Street and the Telecommunications Building.

Since that time the developer has agreed to consider an elevated system through his lands. This change in attitude is largely due to recent investigations of improvements in transit technology which could result in an elevated system that would be free from vibration and have a very low noise level making it acceptable in an urban environment.

The justification for an intermediate system is primarily dependent upon the development and re-development of the area south of Front Street and west of York Street. The peak demand resulting from the short term operation of the C.N.E. may not be accommodated exclusively on such a line. Thus, the justification for such a line is tied directly to the daily demands of the redesigned Exhibition Park, Harbour City, Ontario Place, Toronto Islands and other development in the general corridor where some continuous service is essential. In view of the uncertain status of Harbour City, it is not possible to make a firm recommendation at this time although

it is recognized that a right-of-way for such a line should be protected, desirably, through the Metro Centre site. However, the increased possibility of an elevated system and the apparent adaptability of the newer modes to existing development makes any sizeable commitment for capital funds unnecessary at this time.

The pace of development of the new intermediate capacity modes has been and continues to be rapid. A number of systems are on the threshold of implementation. Knowledge of the status of new mode technology is also much better now than it was even in mid-1970 when the previous report was presented. Exposure to the marked advantages that new modes offer, in terms of reduced noise, vibration, air pollution, and appearance no doubt accounts in large part for the recent willingness on the part of Metro Centre to accept a more prominent, or elevated, system. In fact, it is thought that the prominence of such a system might even be turned to advantage in the modern environment proposed by Metro Centre. As a result, it appears that an Esplanade route for an elevated intermediate capacity system is now considered by Metro Centre to be a reasonable alternative.

2. New Transit Modes and their Characteristics

There are many problems associated with new modes such as the careful design of Metro Centre to accommodate the system, the provision of such things as vehicle storage facilities, interchanges at stations, and passenger handling facilities. These problems are not considered to be serious, however, and will be capable of resolution at the time of construction of the system.

A number of advantages are offered by some of the new mode systems. These are described below.

Capital Costs:

Despite lack of detailed knowledge regarding these types of modes, the capital costs for these systems appear to be substantially less than those of the traditional underground transit system.

Maintenance Costs:

Advanced technological components on several new systems offer the prospect of reduced maintenance costs. Air cushion suspension offers not only low wear, but improved vehicle dead load per seat. Linear induction motors offer propulsion without noise, pollution, moving parts, or contact, combined with simplicity and reliability. Other new systems have been built around advanced or improved conventional technology (suspension and propulsion); while these systems may not exhibit all the advantages listed for air cushion suspension and linear induction motor propulsion, they are available and do incorporate technological and functional advances over some of the conventional modes.

Environmental Effects:

Many of the new modes offer greatly reduced noise and vibration over conventional modes. Noise levels may be on the order of 20 or 30 decibels lower than those produced by traditional modes of transportation. Many systems, both new and conventional, have electrical propulsion systems, which produce virtually no air

pollution at the point of use. While any elevated structure will be considered by some to be a visual intrusion, many of the new modes use lighter structures and have greater flexibility of application than conventional modes, permitting better integration with a planned development.

Automation:

Many of the new mode systems are being designed for automation to improve system operation and to provide relief from the high labour costs of conventional, labour-intensive systems. By obviating the need for vehicle operators, automation makes possible the provision of attractive service even in the off-peak periods at very low incremental cost.

Capacity:

Many of the new modes have capacities in the range of 6,000-20,000 passengers per hour per direction, a capacity range not well served at present by conventional modes with the possible exception of streetcars operating on exclusive rights-of-way; buses cannot handle demands greater than about 6000-7000 passengers per hour per direction, while subways are rarely justified below 20,000. A wide choice of vehicle sizes is also available, ranging from small "capsulized" vehicles to 100 passenger vehicles. A new mode system with a capacity in this range of 6,000-20,000 would appear to be eminently suitable for serving the projected daily peak demands of 8,500 passengers per hour per direction originally assigned to the line through the Metro Centre site. A system with capacity approaching 20,000

Table 1

INTERMEDIATE CAPACITY TRANSIT SYSTEMS — FOUR EXAMPLES

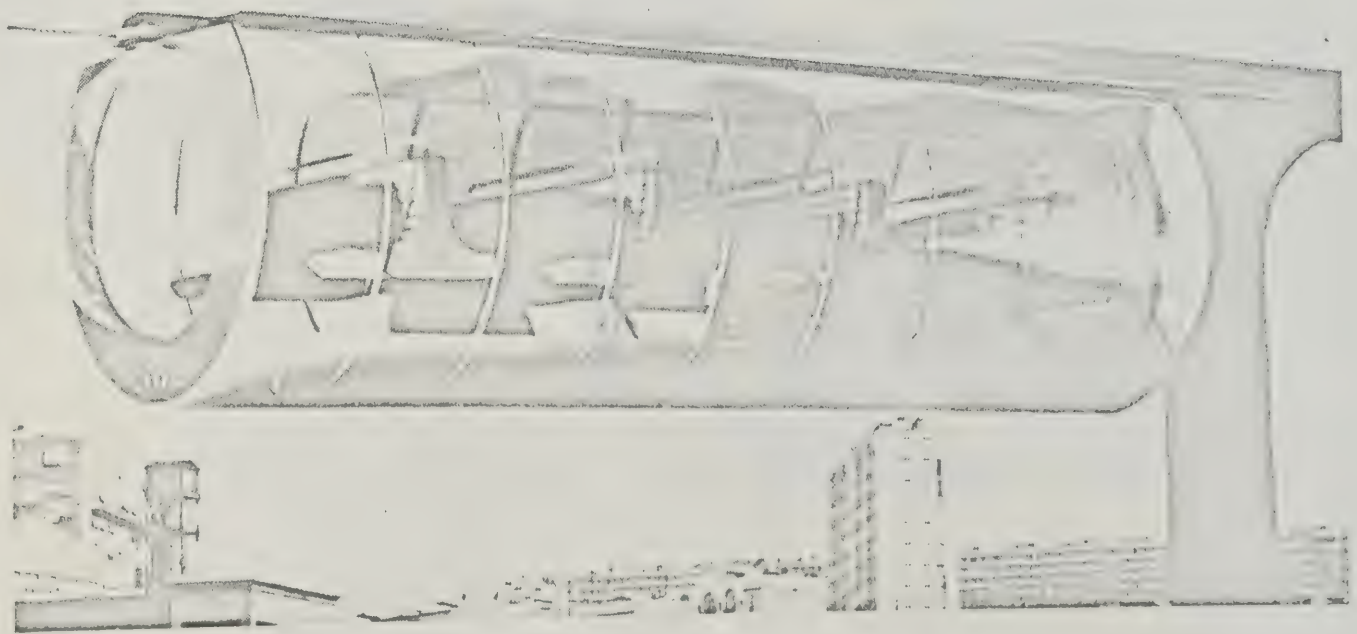
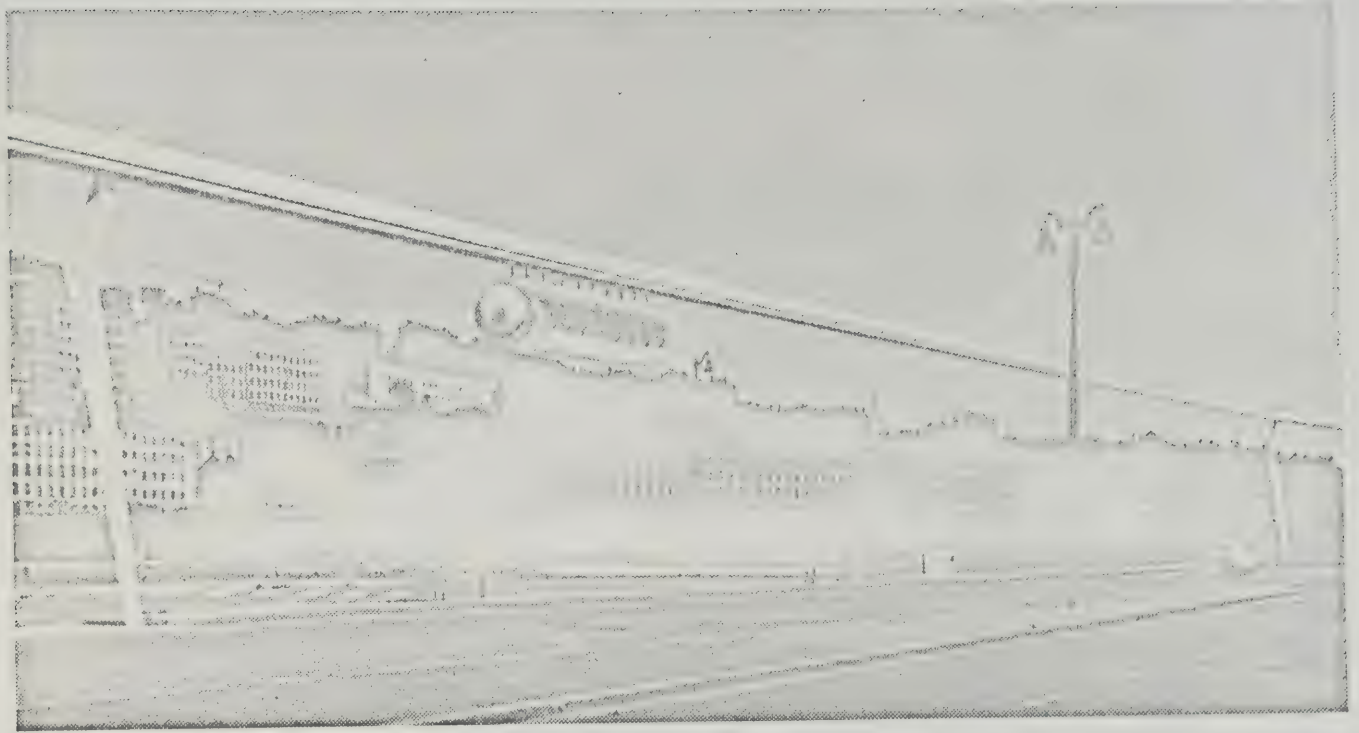
| | SYSTEM CONCEPT | MAXIMUM CAPACITY (Manufacturers' Claims) | VEHICLE SIZE(S) | CRUISE SPEED | GUIDEWAY | STATUS OF DEVELOPMENT |
|-------------------------|--|---|--|--|---|--|
| URBA 30/42 ¹ | <p>Urba takes advantage of advanced technology to provide high quality transportation at moderate cost. Lightweight passenger modules are slung from negative air-cushion supported bogies propelled by silent, vibration-free linear induction motors.</p> <p>Automatic control, but not direct routing is envisioned.</p> | <p>Urba 30 9,000 seated passenger/hr/direction</p> <p>Urba 42 11,000 seated passenger/hr/direction</p> <p>N.B. Urba 100, a larger version having considerably increased capacity is also being developed.</p> | <p>Urba 30/42 length: 26 ft. width: 6.2 ft. height: 6.5 ft.</p> | <p>c. 40 m.p.h. (maximum speed is c. 60 m.p.h.)</p> | <p>Urba's (concrete or steel) box-beam guideway provides an enclosure for the negative air-cushion and contains the reaction rail and other conductors.</p> <p>Switches are active</p> <p>Min. curve radius is about 100 ft.</p> <p>Max. grade is 10%</p> | <p>Test track evaluation and development continue close to operational stage.</p> <p>A 2 1/2 mile commercial system is planned for Lyon very soon. Many other French cities are actively interested.</p> |
| TTI ² | <p>TTI employs 12 and 24 seat capsules which are supported by positive air cushion and propelled by linear induction motors — the motor primaries and air-cushion "Hovair" pads being located on the vehicle undersides.</p> <p>The system is completely automated and is capable of either scheduled operations or direct routing to selected stations.</p> | <p>about 15,000 passenger/hr/direction in scheduled operations</p> <p>about 6,000 seated passenger/hr/direction in direct routing operations</p> | <p>6-passengers length: 10 ft. width: 7.4 ft. height: 5.2 ft.</p> <p>12-passengers length: 13.5 ft. width: 7.4 ft. height: 5.2 ft.</p> | <p>60 m.p.h. (60 m.p.h. is also top speed)</p> | <p>A shallow concrete "U" provides a running surface and lateral guidance for TTI capsules and contains electrical conductors and the reaction rail.</p> <p>Switches are passive</p> <p>Min. curve radius is 50 ft.</p> <p>Max. grade is 5%</p> | <p>Development continues although system is close to being fully operational.</p> <p>A small scale commercial installation is planned for Denver in 1971.</p> <p>Prime contender for new circulation system at Kennedy Airport.</p> |
| STRATOLINE ³ | <p>Apart from complete computer control, the monorail-like Stratoline system employs more or less conventional technology. Lightweight, fibreglass passenger capsules are slung below rubber-tired bogies which run through an enclosing guideway and are propelled by rotary electric motors. Vehicles may run singly or in trains and be scheduled or direct routed.</p> | <p>20,000 passenger/hr/direction</p> | <p>Monocab length: 10 ft. width: 5.2 ft. height: 6.5 ft.</p> <p>Stratocoach length: 18 ft. width: 5.2 ft. height: 6.5 ft.</p> | <p>34 m.p.h. (future top speed is 70 m.p.h.)</p> | <p>The Stratoline guideway is a fabricated steel box-beam enclosing the power bogies and running surface and containing all electrical conductors.</p> <p>Switches are passive</p> <p>Min. curve radius is 10 ft.</p> <p>Max. grade is 45 degrees.</p> | <p>System is now operational although improved versions are being developed.</p> <p>Actively competing for contract to serve new Dallas-Fort Worth Airport.</p> |
| DASHAVEYOR ⁴ | <p>Dashaveyor provides a similar service to Stratoline (being fully automated and capable of direct routing and/or entrainment in scheduled operations) but its configuration is completely different. The rubber-tired power bogies will accept passenger modules of various sizes and are propelled by rotary electric motors along a tightly-gripped concrete duorail guideway. System has proved reliable in industrial use.</p> | <p>15,000 passenger/hr/direction (could be further increased using larger vehicles and/or scheduled trains)</p> | <p>12-seat version length: 21.7 ft. width: 6.5 ft. height: 8.5 ft.</p> | <p>c. 40 m.p.h. (maximum speed is about 60 m.p.h.)</p> | <p>The Dashaveyor guideway is two parallel concrete "I"-beams which are gripped between the wheels of the power bogies.</p> <p>Switches may be passive or active, horizontal or vertical.</p> <p>Min. curve radius is 50 ft.</p> <p>Max. grade: no limit!</p> | <p>Industrial version has been in service since 1967 at White Pine, Michigan copper mine.</p> <p>Development of passenger version continues; company actively competing for installations at Pomona and the Seattle-Tacoma and Los Angeles Airports.</p> |

1. Developed by: La Compagnie d'Énergie Linéaire, 5 Rue Monge, 92 Vanves, France.

2. Developed by: Transportation Technology Incorporated, Denver, Colorado, U.S.A.

3. Developed by: Vero Inc., Inc., Transportation Systems Division, 800 W. Garland Ave., Garland, Texas 75040

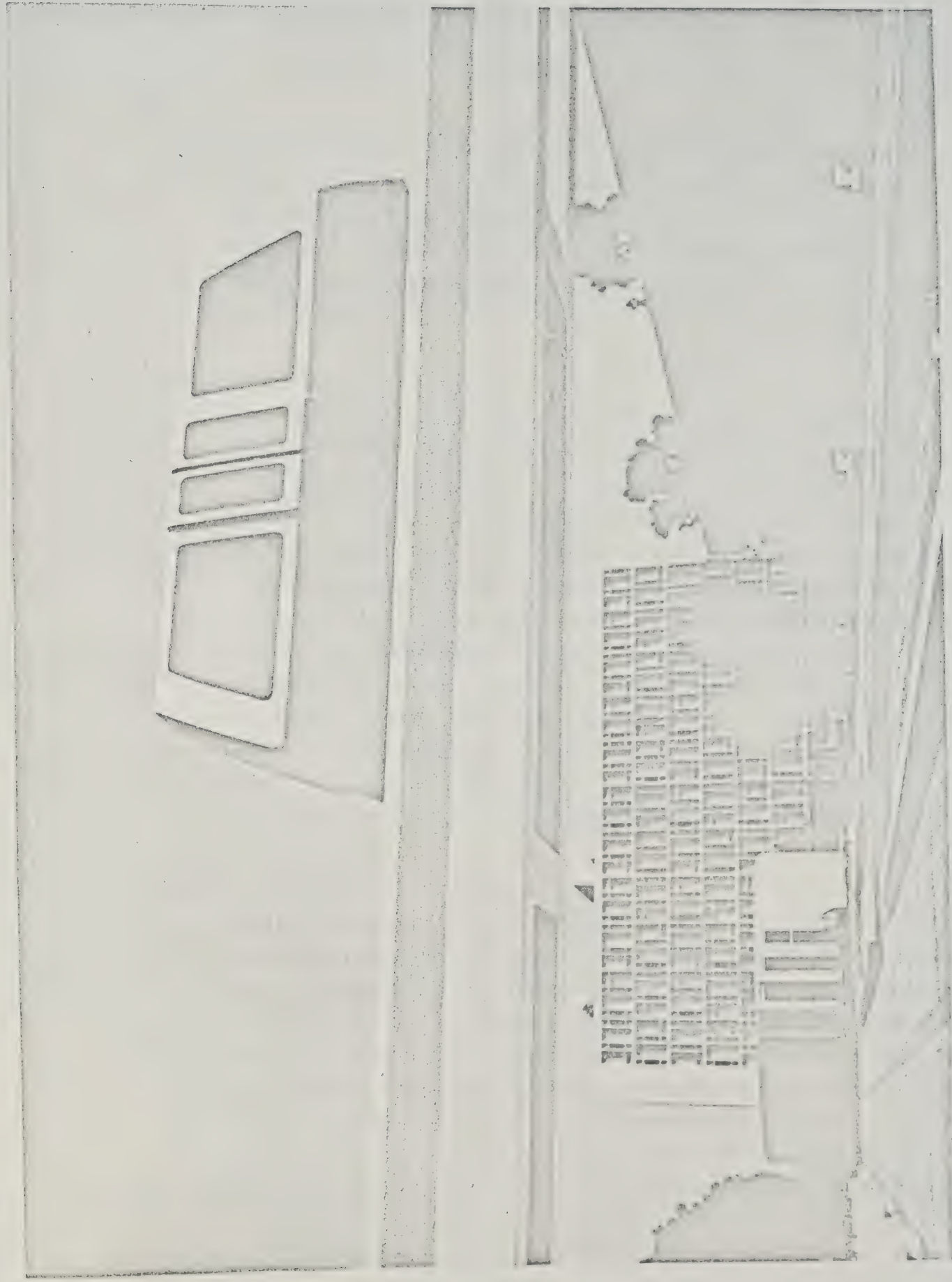
4. Developed by: The Dashaveyor Company, 5419 McConnell Ave., Los Angeles, California 90066



Urba System Fig. 10



Stratoline System Fig. 12



Dashaveyor System Fig. 13

passengers per hour per direction would be able to serve both the projected daily demands and a large part of the peak demands associated with the recreational travel on a line linking Metro Centre, Exhibition Park, Ontario Place, Harbour City, and the Island Park.

Flexibility of Application:

The new modes also exhibit a flexibility of application not found among the conventional modes. Besides offering greater grade (climbing) capabilities, sharper curvature, and a wide range of vehicle sizes, many of the new modes could be appended to buildings providing a much greater range of interface and integration possibilities. The wide range of vehicle sizes and speeds possible even within a single system (for example, 30 mph to 100 mph, depending on station spacing) permits great flexibility for both local and regional application. With off-line stations, it might be possible to operate both regional and local transit service on the same guideway.

Examples of Several New Modes

Table 1 illustrates the characteristics of four selected examples of new intermediate capacity systems. Their inclusion does not necessarily imply recommendation for the Metro Centre intermediate capacity system. The Urba (Figure 10) and Transportation Technology Incorporated (Figure 11) systems both use new technology, namely air cushion suspension and linear induction motors for propulsion. The Stratoline (Figure 12) and Dashaveyor (Figure 13) systems both use conventional

technology, namely wheeled suspension and rotary electric motors. Dashaveyor and TTI sit astride and within their guideways while Stratoline and Urba are suspended from overhead guideways.

3. Possible Locations for New Mode Applications

Because of the flexibility and characteristics of the new modes, any of the three suggested routes through Metro Centre (Front Street, Esplanade, or south side) becomes a possible viable location alternative. Other locations through Metro Centre might also be selected for evaluation in light of the improved capabilities of new modes over conventional modes. Similar comments apply to the choice of location of the intermediate system westerly from Metro Centre to the C.N.E., Ontario Place, and Harbour City. This line could be further extended to provide recreational access to the Island Park. Consideration might be given to several system possibilities:

- (a) A two-way shuttle service on a line connecting Metro Centre, C.N.E., Ontario Place, Harbour City, and the Island Park.

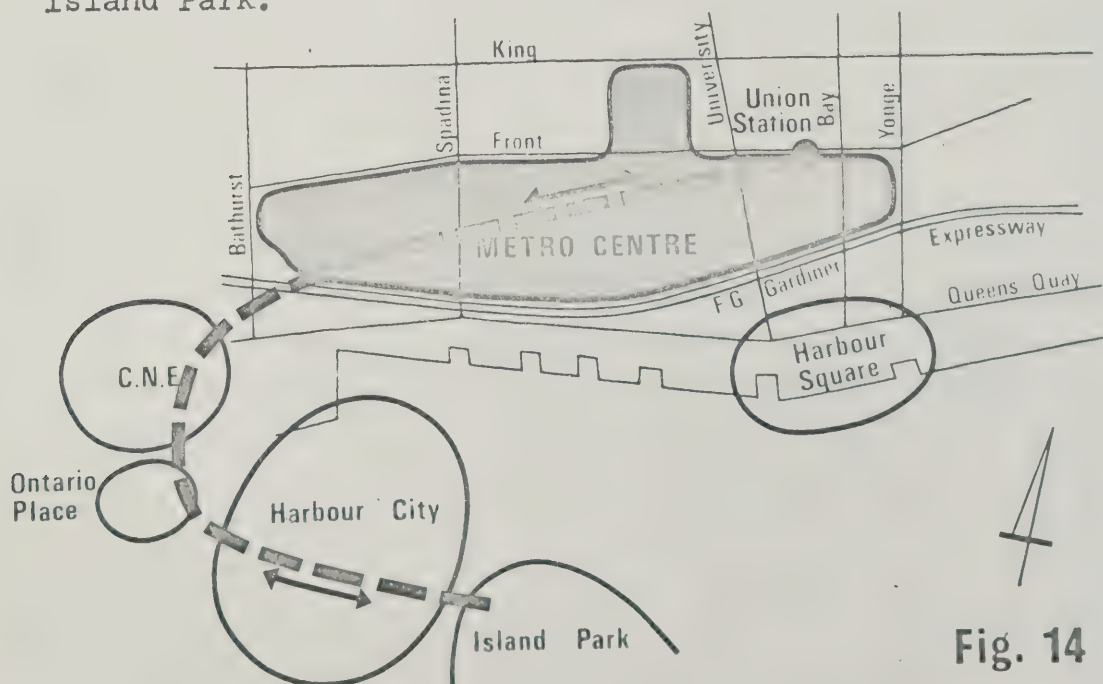


Fig. 14

- (b) A one-way loop configuration linking Metro Centre, C.N.E., Ontario Place, and passing through Harbour City to the Island Park, back through Harbour City and the lakeshore residential developments to Harbour Square and Metro Centre.

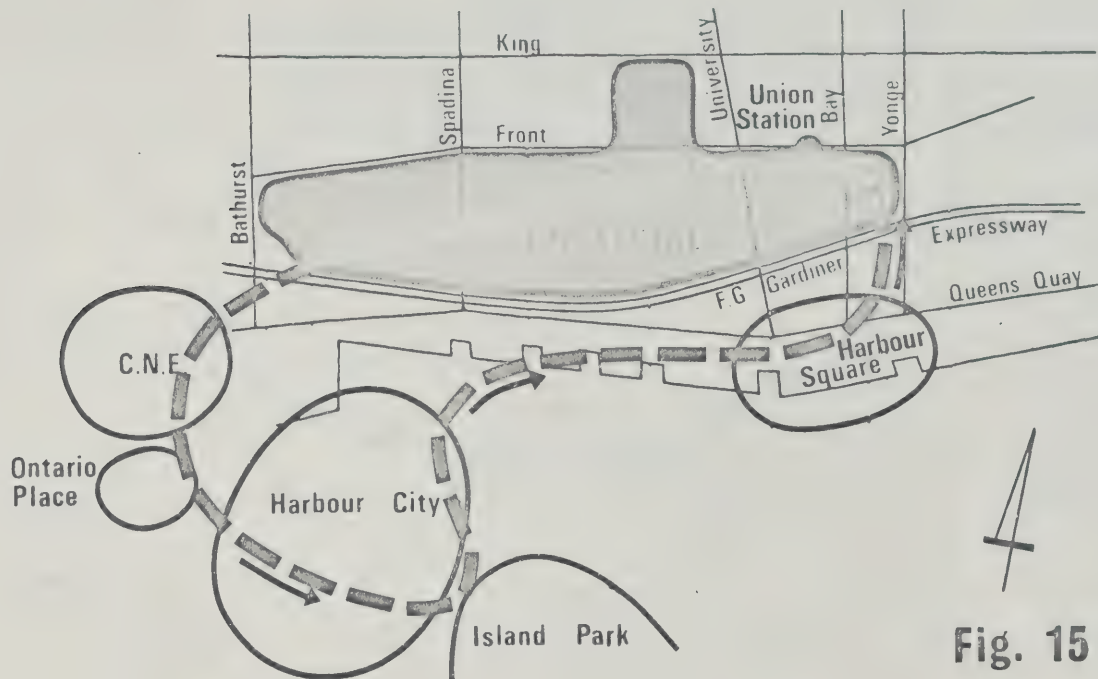


Fig. 15

- (c) A line running easterly from Metro Centre, either as an extension of the two-way line in (a) or as part of a two-way loop connecting Metro Centre, C.N.E., Ontario Place, Harbour City, Island Park, and Harbour Square.

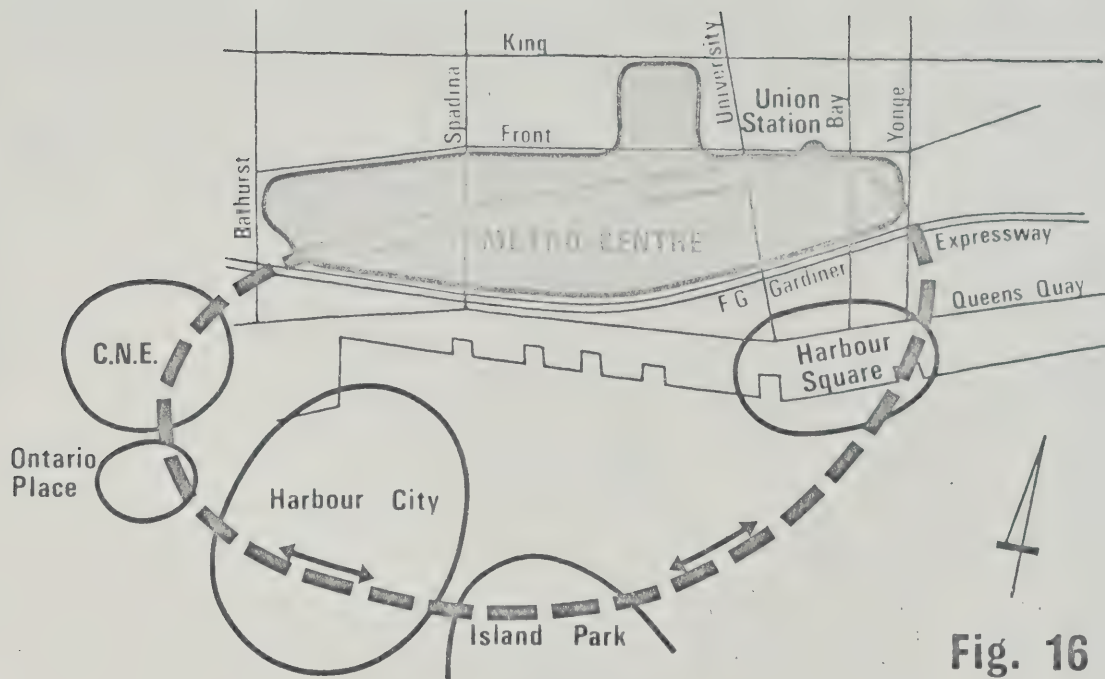


Fig. 16

- (d) The portion of the line between Metro Centre and the C.N.E. could be extended to the west (while retaining the localized systems described in (a), (b), and (c) to form part of a Malton airport link or larger regional transit network. Separate guideways could be built for local and regional service, or off-line stations might permit use of a guideway by both local and regional vehicles.

APPENDIX

APPENDIX

RECOMMENDATIONS OF THE CITY OF TORONTO PLANNING BOARD STAFF -
METRO CENTRE - TRANSPORTATION ELEMENTS - JANUARY 1971

1. That the request by City Council for a review by the Metropolitan Corporation of transportation facilities in the Central Area of the City, particularly in relation to transit facilities as highest priorities, be strongly endorsed.
2. That no commitment to an alignment on Front Street for a potential east-west intermediate transit facility be made at this time, in the light of City Council's request for studies in respect to transit service from Union Station to service developments to the west (Ontario Place, C.N.E., Metro Centre Residential Sections, and projected Harbour City Development).
3. That the Metropolitan Corporation, Toronto Transit Commission, the Province of Ontario, and Metro Centre Developments Limited be requested to review the arrangement of the transportation facilities in the proposed terminal area (interchange) because the present arrangement is considered unacceptable.
4. That such review, reconsider the feasibility of extending the subway southerly, to provide a vertical transportation interchange, and transit connection to the Waterfront.
5. That Metro Centre Developments Limited be invited to submit a brief clarifying its position in respect to the problems of marketability of the commercial elements, in the alternatives considered in this report.
6. That the staff report to the next meeting of the Planning Board on the elements, and areas of the Metro Centre scheme, and other areas of the Central Harbour which can be appropriately developed into amendments to the Official Plan.

RECOMMENDATIONS OF THE METROPOLITAN TORONTO PLANNING BOARD
STAFF IN THE REPORT ON METRO CENTRE - A PLANNING REVIEW,
OCTOBER, 1970

In reply to the request of the City of Toronto Committee on Buildings and Development for comments on the Metro Centre proposal, it is recommended that the Metropolitan Toronto Planning Board advise the Metropolitan Council

1. (a) to endorse in principle the redevelopment of the downtown railway yards as proposed by Metro Centre Developments Limited, together with the recommended public works, subject to satisfactory resolution of the staging of development and suitable arrangements being made for sharing the development costs between the City of Toronto, the developers, the Metropolitan Corporation and other levels of government as appropriate;
- (b) to resolve these matters through the existing Government Liaison Committee consisting of the Metropolitan Chairman, a representative of the City Executive Committee, a representative of the Premier of Ontario and Metro Centre;
2. to accept the principle of an expanded Union Subway Station and an intermediate transit system, subject to further discussions with the Government of Ontario and Metro Centre Developments Limited respecting the division of financial responsibilities for implementing the project; but that every effort be made to improve the distance relationship between all modes of transportation, or to facilitate the movement of passengers between all modes of transportation;
3. together with the developers and the Provincial Government, to investigate the feasibility of the convention centre as a separate aspect of the Metro Centre proposal and to determine the appropriate division of responsibility for building the convention centre;
4. to forward this report to the Toronto City Council for information.

RECOMMENDATIONS BY THE CITY DEPARTMENT OF PUBLIC WORKS IN
THE REPORT ON METRO CENTRE - INTERIM REPORT, NOVEMBER 1970

The following particular recommendations are made:

1. That the Commissioner of Public Works report to your Committee should any change be required to the current staging of the following new watermain as a result of any variance to the present proposed phasing of the Metro Centre project:

| | <u>Estimated Cost</u> | <u>Recommended Staging</u> |
|--|---------------------------|--|
| (a) New 16" diameter connection to John Street Pumping Station | \$ 50,000 | To be completed prior to Phase 4 (1982) |
| (b) New 12" diameter water-main on Front Street from Spadina Avenue to Simcoe Street | \$175,000 | Section of main from Peter Street to Simcoe St. to be completed prior to Phase 2 (1974) Section from Peter Street to Spadina Avenue to be completed prior to Phase 4 (1982) |

2. That the developer be advised that all existing City storm sewer outlets must remain and be accommodated within the development and that all storm drainage for that portion of the development lying south of Front Street must be connected to these existing outlets and, in addition, the developer be advised that all gravity storm drain connections to these existing outlets must be designed to prevent backflow.
3. That the developer be advised that storm drainage from the remainder of the site north of Front Street can be connected to the new road storm sewers which have been installed on John Street and Front Street.
4. That the developer be advised that proposed modifications to the existing streets system will affect certain existing local sewers and that the Commissioner of Public Works be instructed to report to your Committee when detail project drawings are available.
5. That the developer be advised that all sanitary drainage from that portion of the development lying south of Front Street must be connected to the low level interceptor sewer.

6. That the developer be advised that the sanitary system within the portion of the development lying south of Front Street West must be a combination of gravity drains for areas at or above the level of Front Street and pump drains for the area below the level of Front Street.
7. That the developer be advised that the existing local sanitary sewer system along the south limit of this project should, if possible, have no connections from the development.
8. That the developer be advised that sanitary drainage from that portion of the development north of Front Street can be accommodated in the existing sanitary sewer system on the peripheral streets.
9. That the proposed pedestrian movement system be approved in principle and as each phase of the development proceeds the Commissioner of Public Works be required to report further to your Committee on the detailed plans.
10. That parking should be provided for all land use, in accordance with the present zoning by-law requirements, subject to the overlapping or consolidation of such parking requirements due to multiple use purposes and that the City of Toronto Planning Board be requested to report on the parking requirements as the details become available.
11. That the developer be advised that York Street south of Front Street cannot be closed in its entirety and that, in conjunction with the realignment of University Avenue, a spur connection from the realigned University Avenue for northbound traffic to the existing York/Front Streets intersection is required.
12. That the developer be advised that the proposed ramps for northbound vehicular traffic at Yonge Street, Bay Street and Simcoe Street, from the proposed elevated Esplanade roadway to Front Street, are not approved and should be omitted from the plan. Additionally, vehicular access to the site from Front Street between Bay Street and Simcoe Street be designed to operate on the basis of right turns in-out only.
13. That the Metropolitan Corporation be requested to advise the developer that approval in principle is given to the expansion of the Union Subway Station.

14. That the Metropolitan Corporation and the Toronto Transit Commission be requested to review the overall transit system including all facets of the present transit plan, such as the Queen Street subway line, the Spadina rapid transit facility, the station and line capacities of the existing Yonge Street subway and the overall operational details of the system, including the future operation of the wye on the Bloor-Danforth line, and advise City Council thereon.
15. That the Metropolitan Corporation, the Toronto Transit Commission and the Province of Ontario be requested to undertake an immediate study on the possibility of providing satisfactory transit service from the Union Subway Station westerly to service developments, such as Ontario Place, the Canadian National Exhibition and the projected Harbour City development and advise City Council thereon.
16. That the Metropolitan Corporation be requested to inform the developer, if an east-west intermediate transit facility is considered necessary, that it be constructed on the Front Street alignment between the Union Subway Station and Bathurst Street.
17. The Metropolitan Corporation and Gray Coach Lines Limited be advised that your Committee approves of the concept of a bus terminal within Metro Centre. However, since there appears to be some doubt as to the economic feasibility of such a terminal, that Gray Coach Lines Limited and the developer, in cooperation with the other prospective users of this terminal, be requested to produce cost details and operational plans at the earliest possible date in order that the feasibility of this proposal can be determined prior to giving approval in principle of Phase 1 of the development,

That the following guideline recommendations are made:

1. That the Commissioner of Development, in consultation with all other Officials concerned, be requested to report, as soon as possible, on negotiations with the developer concerning land acquisition, property acquisition, land exchange, street closings and openings involved, joint uses and the proposals for cost sharing on all of these items and, furthermore, the report outline any concessions which may be sought by the developer from the respective governments.

2. That the Commissioner of Development, following consultation with other City officials, be requested to report on whether the development should proceed by plan of subdivision or by site plan dedication.

